

(g) Attributable interest shall be defined by reference to the criteria set forth in Notes 1 through 5 to § 76.501.

[61 FR 18977, Apr. 30, 1996, as amended at 64 FR 67196, Dec. 1, 1999]

### Subpart K—Technical Standards

#### § 76.601 Performance tests.

(a) The operator of each cable television system shall be responsible for insuring that each such system is designed, installed, and operated in a manner that fully complies with the provisions of this subpart.

(b) The operator of each cable television system shall conduct complete performance tests of that system at least twice each calendar year (at intervals not to exceed seven months), unless otherwise noted below. The performance tests shall be directed at determining the extent to which the system complies with all the technical standards set forth in § 76.605(a) and shall be as follows:

(1) For cable television systems with 1000 or more subscribers but with 12,500 or fewer subscribers, proof-of-performance tests conducted pursuant to this section shall include measurements taken at six (6) widely separated points. However, within each cable system, one additional test point shall be added for every additional 12,500 subscribers or fraction thereof (e.g., 7 test points if 12,501 to 25,000 subscribers; 8 test points if 25,001 to 37,500 subscribers, etc.). In addition, for technically integrated portions of cable systems that are not mechanically continuous (*i.e.*, employing microwave connections), at least one test point will be required for each portion of the cable system served by a technically integrated microwave hub. The proof-of-performance test points chosen shall be balanced to represent all geographic areas served by the cable system. At least one-third of the test points shall be representative of subscriber terminals most distant from the system input and from each microwave receiver (if microwave transmissions are employed), in terms of cable length. The measurements may be taken at convenient monitoring points in the cable network: Provided, that data shall be included to relate the meas-

ured performance of the system as would be viewed from a nearby subscriber terminal. An identification of the instruments, including the makes, model numbers, and the most recent date of calibration, a description of the procedures utilized, and a statement of the qualifications of the person performing the tests shall also be included.

(2) Proof-of-performance tests to determine the extent to which a cable television system complies with the standards set forth in § 76.605(a) (3), (4), and (5) shall be made on each of the NTSC or similar video channels of that system. Unless otherwise as noted, proof-of-performance tests for all other standards in § 76.605(a) shall be made on a minimum of four (4) channels plus one additional channel for every 100 MHz, or fraction thereof, of cable distribution system upper frequency limit (e.g., 5 channels for cable television systems with a cable distribution system upper frequency limit of 101 to 216 MHz; 6 channels for cable television systems with a cable distribution system upper frequency limit of 217–300 MHz; 7 channels for cable television systems with a cable distribution upper frequency limit to 300 to 400 MHz, etc.). The channels selected for testing must be representative of all the channels within the cable television system.

(3) The operator of each cable television system shall conduct semi-annual proof-of-performance tests of that system, to determine the extent to which the system complies with the technical standards set forth in § 76.605(a)(4) as follows. The visual signal level on each channel shall be measured and recorded, along with the date and time of the measurement, once every six hours (at intervals of not less than five hours or no more than seven hours after the previous measurement), to include the warmest and the coldest times, during a 24-hour period in January or February and in July or August.

(4) The operator of each cable television system shall conduct triennial proof-of-performance tests of its system to determine the extent to which the system complies with the technical standards set forth in § 76.605(a)(11).

(c) Successful completion of the performance tests required by paragraph (b) of this section does not relieve the system of the obligation to comply with all pertinent technical standards at all subscriber terminals. Additional tests, repeat tests, or tests involving specified subscriber terminals may be required by the Commission or the local franchiser to secure compliance with the technical standards.

(d) The provisions of paragraphs (b) and (c) of this section shall not apply to any cable television system having fewer than 1,000 subscribers: *Provided, however*, that any cable television system using any frequency spectrum other than that allocated to over-the-air television and FM broadcasting (as described in §§ 73.603 and 73.210 of this chapter) is required to conduct all tests, measurements and monitoring of signal leakage that are required by this subpart. A cable television system operator complying with the monitoring, logging and the leakage repair requirements of § 76.614, shall be considered to have met the requirements of this paragraph. However, the leakage log shall be retained for five years rather than the two years prescribed in § 76.1706.

NOTE 1 TO § 76.601: Prior to requiring any additional testing pursuant to § 76.601(c), the local franchising authority shall notify the cable operator who will be allowed thirty days to come into compliance with any perceived signal quality problems which need to be corrected. The Commission may request cable operators to test their systems at any time.

NOTE 2 TO § 76.601: Section 76.1717 contains recordkeeping requirements for each system operator in order to show compliance with the technical rules of this subpart.

NOTE 3 TO § 76.601: Section 76.1704 contains recordkeeping requirements for proof of performance tests.

[65 FR 53615, Sept. 5, 2000]

**§ 76.602 Incorporation by reference.**

(a) The materials listed in this section are incorporated by reference in this part. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they exist on the date of the approval, and notice of any change in these ma-

terials will be published in the FEDERAL REGISTER. The materials are available for purchase at the corresponding addresses as noted, and all are available for inspection at the Federal Communications Commission, 445 12th. St., SW., Reference Information Center, Room CY-A257, Washington, DC 20554 and at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(b) The following materials are available for purchase from at least one of the following addresses: Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112 or at <http://global.ihs.com>; or American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036 or at <http://webstore.ansi.org/ansidocstore/default.asp>; or Society of Cable Telecommunications Engineers at <http://www.scte.org/standards/index.cfm>; or Advanced Television Systems Committee, 1750 K Street, NW., Suite 1200, Washington, DC 20006 or at <http://www.atsc.org/standards>.

(1) ANSI/SCTE 26 2001 (formerly DVS 194): “Home Digital Network Interface Specification with Copy Protection,” 2001, IBR approved for § 76.640.

(2) SCTE 28 2003 (formerly DVS 295): “Host-POD Interface Standard,” 2003, IBR approved for § 76.640.

(3) SCTE 41 2003 (formerly DVS 301): “POD Copy Protection System,” 2003, IBR approved for § 76.640.

(4) ANSI/SCTE 54 2003 (formerly DVS 241), “Digital Video Service Multiplex and Transport System Standard for Cable Television,” 2003, IBR approved for § 76.640.

(5) ANSI/SCTE 65 2002 (formerly DVS 234), “Service Information Delivered Out-of-Band for Digital Cable Television,” 2002, IBR approved for § 76.640.

(6) CEA-931-A, “Remote Control Command Pass-through Standard for Home Networking,” 2003, IBR approved for § 76.640.

(7) SCTE 40 2003 (formerly DVS 313), “Digital Cable Network Interface Standard,” 2003, IBR approved for § 76.640.

(8) ATSC A/65B: "ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable (Revision B)," March 18, 2003, IBR approved for § 76.640.

(9) CEA-542-B: "CEA Standard: Cable Television Channel Identification Plan," July 2003, IBR approved for § 76.605.

[68 FR 66734, Nov. 28, 2003, as amended at 69 FR 18803, Apr. 9, 2004; 69 FR 57861, Sept. 28, 2004]

#### § 76.605 Technical standards.

(a) The following requirements apply to the performance of a cable television system as measured at any subscriber terminal with a matched impedance at the termination point or at the output of the modulating or processing equipment (generally the headend) of the cable television system or otherwise as noted. The requirements are applicable to each NTSC or similar video downstream cable television channel in the system:

(1)(i) The cable television channels delivered to the subscriber's terminal shall be capable of being received and displayed by TV broadcast receivers used for off-the-air reception of TV broadcast signals, as authorized under part 73 of this chapter; and

(ii) Cable television systems shall transmit signals to subscriber premises equipment on frequencies in accordance with the channel allocation plan set forth in CEA-542-B: "Standard: Cable Television Channel Identification Plan," (Incorporated by reference, *see* § 76.602).

(2) The aural center frequency of the aural carrier must be 4.5 MHz  $\pm$  5 kHz above the frequency of the visual carrier at the output of the modulating or processing equipment of a cable television system, and at the subscriber terminal.

(3) The visual signal level, across a terminating impedance which correctly matches the internal impedance of the cable system as viewed from the subscriber terminal, shall not be less than 1 millivolt across an internal impedance of 75 ohms (0 dBmV). Additionally, as measured at the end of a 30 meter (100 foot) cable drop that is connected to the subscriber tap, it shall not be less than 1.41 millivolts across

an internal impedance of 75 ohms (+3 dBmV). (At other impedance values, the minimum visual signal level, as viewed from the subscriber terminal, shall be the square root of 0.0133 (Z) millivolts and, as measured at the end of a 30 meter (100 foot) cable drop that is connected to the subscriber tap, shall be 2 times the square root of 0.00662(Z) millivolts, where Z is the appropriate impedance value.)

(4) The visual signal level on each channel, as measured at the end of a 30 meter cable drop that is connected to the subscriber tap, shall not vary more than 8 decibels within any six-month interval, which must include four tests performed in six-hour increments during a 24-hour period in July or August and during a 24-hour period in January or February, and shall be maintained within:

(i) 3 decibels (dB) of the visual signal level of any visual carrier within a 6 MHz nominal frequency separation;

(ii) 10 dB of the visual signal level on any other channel on a cable television system of up to 300 MHz of cable distribution system upper frequency limit, with a 1 dB increase for each additional 100 MHz of cable distribution system upper frequency limit (e.g., 11 dB for a system at 301–400 MHz; 12 dB for a system at 401–500 MHz, *etc.*); and

(iii) A maximum level such that signal degradation due to overload in the subscriber's receiver or terminal does not occur.

(5) The rms voltage of the aural signal shall be maintained between 10 and 17 decibels below the associated visual signal level. This requirement must be met both at the subscriber terminal and at the output of the modulating and processing equipment (generally the headend). For subscriber terminals that use equipment which modulate and remodulate the signal (e.g., baseband converters), the rms voltage of the aural signal shall be maintained between 6.5 and 17 decibels below the associated visual signal level at the subscriber terminal.

(6) The amplitude characteristic shall be within a range of  $\pm 2$  decibels from 0.75 MHz to 5.0 MHz above the lower boundary frequency of the cable television channel, referenced to the

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average of the highest and lowest amplitudes within these frequency boundaries. The amplitude characteristic shall be measured at the subscriber terminal.

(7) The ratio of RF visual signal level to system noise shall not be less than 43 decibels. For class I cable television channels, the requirements of this section are applicable only to:

(i) Each signal which is delivered by a cable television system to subscribers within the predicted Grade B contour for that signal;

(ii) Each signal which is first picked up within its predicted Grade B contour;

(iii) Each signal that is first received by the cable television system by direct video feed from a TV broadcast station, a low power TV station, or a TV translator station.

(8) The ratio of visual signal level to the rms amplitude of any coherent disturbances such as intermodulation products, second and third order distortions or discrete-frequency interfering signals not operating on proper offset assignments shall be as follows:

(i) The ratio of visual signal level to coherent disturbances shall not be less than 51 decibels for noncoherent channel cable television systems, when measured with modulated carriers and time averaged; and

(ii) The ratio of visual signal level to coherent disturbances which are frequency-coincident with the visual carrier shall not be less than 47 decibels for coherent channel cable systems, when measured with modulated carriers and time averaged.

(9) The terminal isolation provided to each subscriber terminal:

(i) Shall not be less than 18 decibels. In lieu of periodic testing, the cable operator may use specifications provided by the manufacturer for the terminal isolation equipment to meet this standard; and

(ii) Shall be sufficient to prevent reflections caused by open-circuited or short-circuited subscriber terminals from producing visible picture impairments at any other subscriber terminal.

(10) The peak-to-peak variation in visual signal level caused by undesired low frequency disturbances (hum or re-

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petitive transients) generated within the system, or by inadequate low frequency response, shall not exceed 3 percent of the visual signal level. Measurements made on a single channel using a single unmodulated carrier may be used to demonstrate compliance with this parameter at each test location.

(11) As of June 30, 1995, the following requirements apply to the performance of the cable television system as measured at the output of the modulating or processing equipment (generally the headend) of the system:

(i) The chrominance-luminance delay inequality (or chroma delay), which is the change in delay time of the chrominance component of the signal relative to the luminance component, shall be within 170 nanoseconds.

(ii) The differential gain for the color subcarrier of the television signal, which is measured as the difference in amplitude between the largest and smallest segments of the chrominance signal (divided by the largest and expressed in percent), shall not exceed  $\pm 20\%$ .

(iii) The differential phase for the color subcarrier of the television signal which is measured as the largest phase difference in degrees between each segment of the chrominance signal and reference segment (the segment at the blanking level of 0 IRE), shall not exceed  $\pm 10$  degrees.

(12) As an exception to the general provision requiring measurements to be made at subscriber terminals, and without regard to the type of signals carried by the cable television system, signal leakage from a cable television system shall be measured in accordance with the procedures outlined in § 76.609(h) and shall be limited as follows:

Frequencies	Signal leakage limit (micro-volt/meter)	Distance in meters (m)
Less than and including 54 MHz, and over 216 MHz .....	15	30
Over 54 up to and including 216 MHz .....	20	3

(b) Cable television systems distributing signals by using methods such as

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nonconventional coaxial cable techniques, noncoaxial copper cable techniques, specialized coaxial cable and fiber optical cable hybridization techniques or specialized compression techniques or specialized receiving devices, and which, because of their basic design, cannot comply with one or more of the technical standards set forth in paragraph (a) of this section, may be permitted to operate; Provided, That an adequate showing is made pursuant to § 76.7 which establishes that the public interest is benefited. In such instances, the Commission may prescribe special technical requirements to ensure that subscribers to such systems are provided with an equivalent level of good quality service.

NOTE 1: Local franchising authorities of systems serving fewer than 1000 subscribers may adopt standards less stringent than those in § 76.605(a). Any such agreement shall be reduced to writing and be associated with the system's proof-of-performance records.

NOTE 2: For systems serving rural areas as defined in § 76.5, the system may negotiate with its local franchising authority for standards less stringent than those in §§ 76.605(a)(3), 76.605(a)(7), 76.605(a)(8), 76.605(a)(10) and 76.605(a)(11). Any such agreement shall be reduced to writing and be associated with the system's proof-of-performance records.

NOTE 3: The requirements of this section shall not apply to devices subject to the TV interface device rules under part 15 of this chapter.

NOTE 4: Should subscriber complaints arise from a system failing to meet § 76.605(a)(6) prior to December 30, 1999, the cable operator will be required to provide a converter that will allow the system to meet the standard immediately at the complaining subscriber's terminal. Further, should the problem be found to be system-wide, the Commission may order all converters on the system be changed to meet the standard.

NOTE 5: Should subscriber complaints arise from a system failing to meet § 76.605(a)(10), the cable operator will be required to remedy the complaint and perform test measurements on § 76.605(a)(10) containing the full number of channels as indicated in § 76.601(b)(2) at the complaining subscriber's terminal. Further, should the problem be found to be system-wide, the Commission may order that the full number of channels as indicated in § 76.601(b)(2) be tested at all required locations for future proof-of-performance tests.

NOTE 6: No State or franchising authority may prohibit, condition, or restrict a cable

system's use of any type of subscriber equipment or any transmission technology.

[37 FR 3278, Feb. 12, 1972]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 76.605 see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at [www.fdsys.gov](http://www.fdsys.gov).

### § 76.606 Closed captioning.

(a) As of June 30, 1992, the operator of each cable television system shall not take any action to remove or alter closed captioning data contained on line 21 of the vertical blanking interval.

(b) As of July 1, 1993, the operator of each cable television system shall deliver intact closed captioning data contained on line 21 of the vertical blanking interval, as it arrives at the headend or from another origination source, to subscriber terminals and (when so delivered to the cable system) in a format that can be recovered and displayed by decoders meeting § 15.119 of this chapter.

[57 FR 11003, Apr. 1, 1992]

### § 76.609 Measurements.

(a) Measurements made to demonstrate conformity with the performance requirements set forth in §§ 76.601 and 76.605 shall be made under conditions which reflect system performance during normal operations, including the effect of any microwave relay operated in the Cable Television Relay (CARS) Service intervening between pickup antenna and the cable distribution network. Amplifiers shall be operated at normal gains, either by the insertion of appropriate signals or by manual adjustment. Special signals inserted in a cable television channel for measurement purposes should be operated at levels approximating those used for normal operation. Pilot tones, auxiliary or substitute signals, and nontelevision signals normally carried on the cable television system should be operated at normal levels to the extent possible. Some exemplary, but not mandatory, measurement procedures are set forth in this section.

(b) When it may be necessary to remove the television signal normally carried on a cable television channel in

order to facilitate a performance measurement, it will be permissible to disconnect the antenna which serves the channel under measurement and to substitute therefor a matching resistance termination. Other antennas and inputs should remain connected and normal signal levels should be maintained on other channels.

(c) As may be necessary to ensure satisfactory service to a subscriber, the Commission may require additional tests to demonstrate system performance or may specify the use of different test procedures.

(d) The frequency response of a cable television channel may be determined by one of the following methods, as appropriate:

(1) By using a swept frequency or a manually variable signal generator at the sending end and a calibrated attenuator and frequency-selective voltmeter at the subscriber terminal; or

(2) By using either a multiburst generator or vertical interval test signals and either a modulator or processor at the sending end, and by using either a demodulator and either an oscilloscope display or a waveform monitor display at the subscriber terminal.

(e) System noise may be measured using a frequency-selective voltmeter (field strength meter) which has been suitably calibrated to indicate rms noise or average power level and which has a known bandwidth. With the system operating at normal level and with a properly matched resistive termination substituted for the antenna, noise power indications at the subscriber terminal are taken in successive increments of frequency equal to the bandwidth of the frequency-selective voltmeter, summing the power indications to obtain the total noise power present over a 4 MHz band centered within the cable television channel. If it is established that the noise level is constant within this bandwidth, a single measurement may be taken which is corrected by an appropriate factor representing the ratio of 4 MHz to the noise bandwidth of the frequency-selective voltmeter. If an amplifier is inserted between the frequency-selective voltmeter and the subscriber terminal in order to facili-

tate this measurement, it should have a bandwidth of at least 4 MHz and appropriate corrections must be made to account for its gain and noise figure. Alternatively, measurements made in accordance with the NCTA Recommended Practices for Measurements on Cable Television Systems, 2nd edition, November 1989, on noise measurement may be employed.

(f) The amplitude of discrete frequency interfering signals within a cable television channel may be determined with either a spectrum analyzer or with a frequency-selective voltmeter (field strength meter), which instruments have been calibrated for adequate accuracy. If calibration accuracy is in doubt, measurements may be referenced to a calibrated signal generator, or a calibrated variable attenuator, substituted at the point of measurement. If an amplifier is used between the subscriber terminal and the measuring instrument, appropriate corrections must be made to account for its gain.

(g) The terminal isolation between any two terminals in the cable television system may be measured by applying a signal of known amplitude to one terminal and measuring the amplitude of that signal at the other terminal. The frequency of the signal should be close to the midfrequency of the channel being tested. Measurements of terminal isolation are not required when either:

(1) The manufacturer's specifications for subscriber tap isolation based on a representative sample of no less than 500 subscribers taps or

(2) Laboratory tests performed by or for the operator of a cable television system on a representative sample of no less than 50 subscriber taps, indicates that the terminal isolation standard of § 76.605(a)(9) is met.

To demonstrate compliance with § 76.605(a)(9), the operator of a cable television system shall attach either such manufacturer's specifications or laboratory measurements as an exhibit to each proof-of-performance record.

(h) Measurements to determine the field strength of the signal leakage emanated by the cable television system shall be made in accordance with

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standard engineering procedures. Measurements made on frequencies above 25 MHz shall include the following:

(1) A field strength meter of adequate accuracy using a horizontal dipole antenna shall be employed.

(2) Field strength shall be expressed in terms of the rms value of synchronizing peak for each cable television channel for which signal leakage can be measured.

(3) The resonant half wave dipole antenna shall be placed 3 meters from and positioned directly below the system components and at 3 meters above ground. Where such placement results in a separation of less than 3 meters between the center of the dipole antenna and the system components, or less than 3 meters between the dipole and ground level, the dipole shall be repositioned to provide a separation of 3 meters from the system components at a height of 3 meters or more above ground.

(4) The horizontal dipole antenna shall be rotated about a vertical axis and the maximum meter reading shall be used.

(5) Measurements shall be made where other conductors are 3 or more meters (10 or more feet) away from the measuring antenna.

(i) For systems using cable traps and filters to control the delivery of specific channels to the subscriber terminal, measurements made to determine compliance with § 76.605(a) (5) and (6) may be performed at the location immediately prior to the trap or filter for the specific channel. The effects of these traps or filters, as certified by the system engineer or the equipment manufacturer, must be attached to each proof-of-performance record.

(j) Measurements made to determine the differential gain, differential phase and the chrominance-luminance delay inequality (chroma delay) shall be made in accordance with the NCTA Recommended Practices for Measurements on Cable Television Systems, 2nd edition, November 1989, on these parameters.

[37 FR 3278, Feb. 12, 1972, as amended at 37 FR 13867, July 14, 1972; 41 FR 10067, Mar. 9, 1976; 42 FR 21782, Apr. 29, 1977; 49 FR 45441, Nov. 16, 1984; 57 FR 11004, Apr. 1, 1992; 57 FR 61011, Dec. 23, 1992; 58 FR 44952, Aug. 25, 1993]

### § 76.610 Operation in the frequency bands 108–137 and 225–400 MHz—scope of application.

The provisions of §§ 76.605(a)(12), 76.611, 76.612, 76.613, 76.614, 76.616, 76.617, 76.1803 and 76.1804 are applicable to all MVPDs (cable and non-cable) transmitting carriers or other signal components carried at an average power level equal to or greater than  $10^{-4}$  watts across a 25 kHz bandwidth in any 160 microsecond period, at any point in the cable distribution system in the frequency bands 108–137 and 225–400 MHz for any purpose. Exception: Non-cable MVPDs serving less than 1000 subscribers and less than 1000 units do not have to comply with § 76.1803.

[69 FR 57862, Sept. 28, 2004]

### § 76.611 Cable television basic signal leakage performance criteria.

(a) No cable television system shall commence or provide service in the frequency bands 108–137 and 225–400 MHz unless such systems is in compliance with one of the following cable television basic signal leakage performance criteria:

(1) prior to carriage of signals in the aeronautical radio bands and at least once each calendar year, with no more than 12 months between successive tests thereafter, based on a sampling of at least 75% of the cable strand, and including any portion of the cable system which are known to have or can reasonably be expected to have less leakage integrity than the average of the system, the cable operator demonstrates compliance with a cumulative signal leakage index by showing either that (i)  $10 \log I_{3000}$  is equal to or less than  $-7$  or (ii)  $10 \log I_{\infty}$  is equal to or less than 64, using one of the following formula:

$$I_{3000} = \frac{1}{\theta} \sum_{i=1}^n \frac{E_i^2}{R_i^2},$$

$$I_{\infty} = \frac{1}{\theta} \sum_{i=1}^n E_i^2,$$

where:

$$R_i^2 = r_i^2 + (3000)^2$$

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$r_i$  is the distance (in meters) between the leakage source and the center of the cable television system;

$\theta$  is the fraction of the system cable length actually examined for leakage sources and is equal to the strand kilometers (strand miles) of plant tested divided by the total strand kilometers (strand miles) in the plant;

$R_i$  is the slant height distance (in meters) from leakage source  $i$  to a point 3000 meters above the center of the cable television system;

$E_i$  is the electric field strength in microvolts per meter ( $\mu\text{V/m}$ ) measured pursuant to § 76.609(h) 3 meters from the leak  $i$ ; and

$n$  is the number of leaks found of field strength equal to or greater than 50  $\mu\text{V/m}$  pursuant to Section 76.609(h).

The sum is carried over all leaks  $i$  detected in the cable examined; or

(2) prior to carriage of signals in the aeronautical radio bands and at least once each calendar year, with no more than 12 months between successive tests thereafter, the cable operator demonstrates by measurement in the airspace that at no point does the field strength generated by the cable system exceed 10 microvolts per meter ( $\mu\text{V/m}$ ) RMS at an altitude of 450 meters above the average terrain of the cable system. The measurement system (including the receiving antenna) shall be calibrated against a known field of 10  $\mu\text{V/m}$  RMS produced by a well characterized antenna consisting of orthogonal resonant dipoles, both parallel to and one quarter wavelength above the ground plane of a diameter of two meters or more at ground level. The dipoles shall have centers collocated and be excited 90 degrees apart. The half-power bandwidth of the detector shall be 25 kHz. If an aeronautical receiver is used for this purpose it shall meet the standards of the Radio Technical Commission for Aeronautics (RCTA) for aeronautical communications receivers. The aircraft antenna shall be horizontally polarized. Calibration shall be made in the community unit or, if more than one, in any of the community units of the physical system within a reasonable time period to performing the measurements. If data is recorded digitally the 90th percentile level of points recorded over the cable system shall not exceed 10  $\mu\text{V/m}$  RMS; if analog recordings is used the peak values of the curves, when

smoothed according to good engineering practices, shall not exceed 10  $\mu\text{V/m}$  RMS.

(b) In paragraphs (a)(1) and (a)(2) of this section the unmodulated test signal used on the cable plant shall: (1) Be within the VHF aeronautical band 108–137 MHz or any other frequency in which the results can be correlated to the VHF aeronautical band and (2) have an average power level equal to the average power level of the strongest cable television carrier on the system.

(c) In paragraph (a)(1) and (2) of this section, if a modulated test signal is used, the test signal and detector technique must, when considered together, yield the same result as though an unmodulated test signal were used in conjunction with a detection technique which would yield the RMS value of said unmodulated carrier.

(d) If a sampling of at least 75% of the cable strand (and including any portions of the cable system which are known to have or can reasonably be expected to have less leakage integrity than the average of the system) as described in paragraph (a)(1) cannot be obtained by the cable operator or is otherwise not reasonably feasible, the cable operator shall perform the airspace measurements described in paragraph (a)(2).

(e) Prior to providing service to any subscriber on a new section of cable plant, the operator shall show compliance with either: (1) The basic signal leakage criteria in accordance with paragraph (a)(1) or (a)(2) of this section for the entire plant in operation or (2) a showing shall be made indicating that no individual leak in the new section of the plant exceeds 20  $\mu\text{V/m}$  at 3 meters in accordance with § 76.609 of the Rules.

(f) Notwithstanding paragraph (a) of this section, a cable operator shall be permitted to operate on any frequency which is offset pursuant to § 76.612 in the frequency band 108–137 MHz for the purpose of demonstrating compliance with the cable television basic signal leakage performance criteria.

[50 FR 29399, July 19, 1985, as amended at 53 FR 2499, Jan. 28, 1988; 53 FR 5684, Feb. 25, 1988; 58 FR 44952, Aug. 25, 1993]



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### § 76.612 Cable television frequency separation standards.

All cable television systems which operate in the frequency bands 108–137 and 225–400 MHz shall comply with the following frequency separation standards:

(a) In the aeronautical radiocommunication bands 118–137, 225–328.6 and 335.4–400 MHz, the frequency of all carrier signals or signal components carried at an average power level equal to or greater than  $10^{-4}$  watts in a 25 kHz bandwidth in any 160 microsecond period must operate at frequencies offset from certain frequencies which may be used by aeronautical radio services operated by Commission licensees or by the United States Government or its Agencies. The aeronautical frequencies from which offsets must be maintained are those frequencies which are within one of the aeronautical bands defined in this subparagraph, and when expressed in MHz and divided by 0.025 yield an integer. The offset must meet one of the following two criteria:

(1) All such cable carriers or signal components shall be offset by 12.5 kHz with a frequency tolerance of  $\pm 5$  kHz; or

(2) The fundamental frequency from which the visual carrier frequencies are derived by multiplication by an integer number which shall be 6.0003 MHz with a tolerance of  $\pm 1$  Hz (Harmonically Related Carrier (HRC) comb generators only).

(b) In the aeronautical radionavigation bands 108–118 and 328.6–335.4 MHz, the frequency of all carrier signals or signal components carrier at an average power level equal to or greater than  $10^{-4}$  watts in a 25 kHz bandwidth in any 160 microsecond period shall be offset by 25 kHz with a tolerance of  $\pm 5$  kHz. The aeronautical radionavigation frequencies from which offsets must be maintained are defined as follows:

(1) Within the aeronautical band 108–118 MHz when expressed in MHz and divided by 0.025 yield an even integer.

(2) Within the band 328.6–335.4 MHz, the radionavigation glide path channels are listed in Section 87.501 of the Rules.

NOTE: The HRC system, as described above, will meet this requirement in the 328.6–335.4

MHz navigation glide path band. Those Incrementally Related Carriers (IRC) systems, with comb generator reference frequencies set at certain odd multiples equal to or greater than 3 times the 0.0125 MHz aeronautical communications band offset, e.g.  $(6n + 1.250 \pm 0.0375)$  MHz, may also meet the 25 kHz offset requirement in the navigation glide path band.

[50 FR 29400, July 19, 1985]

### § 76.613 Interference from a multi-channel video programming distributor (MVPD).

(a) Harmful interference is any emission, radiation or induction which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with this chapter.

(b) An MVPD that causes harmful interference shall promptly take appropriate measures to eliminate the harmful interference.

(c) If harmful interference to radio communications involving the safety of life and protection of property cannot be promptly eliminated by the application of suitable techniques, operation of the offending MVPD or appropriate elements thereof shall immediately be suspended upon notification by the District Director and/or Resident Agent of the Commission's local field office, and shall not be resumed until the interference has been eliminated to the satisfaction of the District Director and/or Resident Agent. When authorized by the District Director and/or Resident Agent, short test operations may be made during the period of suspended operation to check the efficacy of remedial measures.

(d) The MVPD may be required by the District Director and/or Resident Agent to prepare and submit a report regarding the cause(s) of the interference, corrective measures planned or taken, and the efficacy of the remedial measures.

[42 FR 41296, Aug. 16, 1977, as amended at 62 FR 61031, Nov. 14, 1997]

### § 76.614 Cable television system regular monitoring.

Cable television operators transmitting carriers in the frequency bands 108–137 and 225–400 MHz shall provide

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for a program of regular monitoring for signal leakage by substantially covering the plant every three months. The incorporation of this monitoring program into the daily activities of existing service personnel in the discharge of their normal duties will generally cover all portions of the system and will therefore meet this requirement. Monitoring equipment and procedures utilized by a cable operator shall be adequate to detect a leakage source which produces a field strength in these bands of 20 uV/m or greater at a distance of 3 meters. During regular monitoring, any leakage source which produces a field strength of 20 uV/m or greater at a distance of 3 meters in the aeronautical radio frequency bands shall be noted and such leakage sources shall be repaired within a reasonable period of time.

NOTE 1 TO § 76.614: Section 76.1706 contains signal leakage recordkeeping requirements applicable to cable operators.

[65 FR 53616, Sept. 5, 2000]

## § 76.616 Operation near certain aeronautical and marine emergency radio frequencies.

(a) The transmission of carriers or other signal components capable of delivering peak power levels equal to or greater than  $10^{-5}$  watts at any point in a cable television system is prohibited within 100 kHz of the frequency 121.5 MHz, and is prohibited within 50 kHz of the two frequencies 156.8 MHz and 243.0 MHz.

(b) At any point on a cable system from 405.925 MHz to 406.176 MHz analog transmissions are prohibited from delivering peak power levels equal to or greater than  $10^{-5}$  watts. The transmission of digital signals in this range is limited to power levels measured using a root-mean-square detector of less than  $10^{-5}$  watts in any 30 kHz bandwidth over any 2.5 millisecond interval.

[69 FR 57862, Sept. 28, 2004]

## § 76.617 Responsibility for interference.

Interference resulting from the use of cable system terminal equipment (including subscriber terminal, input selector switch and any other acces-

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sories) shall be the responsibility of the cable system terminal equipment operator in accordance with the provisions of part 15 of this chapter: provided, however, that the operator of a cable system to which the cable system terminal equipment is connected shall be responsible for detecting and eliminating any signal leakage where that leakage would cause interference outside the subscriber's premises and/or would cause the cable system to exceed the Part 76 signal leakage requirements. In cases where excessive signal leakage occurs, the cable operator shall be required only to discontinue service to the subscriber until the problem is corrected.

[53 FR 46619, Nov. 18, 1989]

## §§ 76.618–76.620 [Reserved]

## § 76.630 Compatibility with consumer electronics equipment.

(a) Cable system operators shall not scramble or otherwise encrypt signals carried on the basic service tier. Requests for waivers of this prohibition must demonstrate either a substantial problem with theft of basic tier service or a strong need to scramble basic signals for other reasons. As part of this showing, cable operators are required to notify subscribers by mail of waiver requests. The notice to subscribers must be mailed no later than thirty calendar days from the date the request waiver was filed with the Commission, and cable operators must inform the Commission in writing, as soon as possible, of that notification date. The notification to subscribers must state:

On (date of waiver request was filed with the Commission), (cable operator's name) filed with the Federal Communications Commission a request for waiver of the rule prohibiting scrambling of channels on the basic tier of service, 47 CFR 76.630(a). The request for waiver states (a brief summary of the waiver request). A copy of the request for waiver is on file for public inspection at (the address of the cable operator's local place of business).

Individuals who wish to comment on this request for waiver should mail comments to the Federal Communications Commission by no later than 30 days from (the date the notification was mailed to subscribers). Those

comments should be addressed to the: Federal Communications Commission, Media Bureau, Washington, DC 20554, and should include the name of the cable operator to whom the comments are applicable. Individuals should also send a copy of their comments to (the cable operator at its local place of business). Cable operators may file comments in reply no later than 7 days from the date subscriber comments must be filed.

(b) Cable system operators that provide their subscribers with cable system terminal devices and other customer premises equipment that incorporates remote control capability shall permit the remote operation of such devices with commercially available remote control units or otherwise take no action that would prevent the devices from being operated by a commercially available remote control unit. Cable system operators are advised that this requirement obliges them to actively enable the remote control functions of customer premises equipment where those functions do not operate without a special activation procedure. Cable system operators may, however, disable the remote control functions of a subscriber's customer premises equipment where requested by the subscriber.

NOTE 1 TO § 76.630: The provisions of paragraphs (a) and (b) of this section are applicable July 31, 1994, and June 30, 1994, respectively.

NOTE 2 TO § 76.630: § 76.1621 contains certain requirements pertaining to a cable operator's offer to supply subscribers with special equipment that will enable the simultaneous reception of multiple signals.

NOTE 3 TO § 76.630: § 76.1622 contains certain requirements pertaining to the provision of a consumer education program on compatibility matters to subscribers.

NOTE 4 TO § 76.630: Cable operators must comply with the notification requirements pertaining to the waiver of the prohibition against scrambling and encryption, and comply with the public file requirement in connection with such waiver.

[59 FR 25342, May 16, 1994, as amended at 61 FR 18510, Apr. 26, 1996; 65 FR 53616, Sept. 5, 2000; 67 FR 1650, Jan. 14, 2002; 67 FR 13235, Mar. 21, 2002]

**§ 76.640 Support for unidirectional digital cable products on digital cable systems.**

(a) The requirements of this section shall apply to digital cable systems. For purposes of this section, digital

cable systems shall be defined as a cable system with one or more channels utilizing QAM modulation for transporting programs and services from its headend to receiving devices. Cable systems that only pass through 8 VSB broadcast signals shall not be considered digital cable systems.

(b) No later than July 1, 2004, cable operators shall support unidirectional digital cable products, as defined in § 15.123 of this chapter, through the provisioning of Point of Deployment modules (PODs) and services, as follows:

(1) Digital cable systems with an activated channel capacity of 750 MHz or greater shall comply with the following technical standards and requirements:

(i) SCTE 40 2003 (formerly DVS 313): "Digital Cable Network Interface Standard" (incorporated by reference, *see* § 76.602), provided however that with respect to Table B.11, the Phase Noise requirement shall be -86 dB/Hz, and also provided that the "transit delay for most distant customer" requirement in Table B.3 is not mandatory.

(ii) ANSI/SCTE 65 2002 (formerly DVS 234): "Service Information Delivered Out-of-Band for Digital Cable Television" (incorporated by reference, *see* § 76.602), provided however that the referenced Source Name Subtable shall be provided for Profiles 1, 2, and 3.

(iii) ANSI/SCTE 54 2003 (formerly DVS 241): "Digital Video Service Multiplex and Transport System Standard for Cable Television" (incorporated by reference, *see* § 76.602).

(iv) For each digital transport stream that includes one or more services carried in-the-clear, such transport stream shall include virtual channel data in-band in the form of ATSC A/65B: "ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable (Revision B)" (incorporated by reference, *see* § 76.602), when available from the content provider. With respect to in-band transport:

(A) The data shall, at minimum, describe services carried within the transport stream carrying the PSIP data itself;

(B) PSIP data describing a twelve-hour time period shall be carried for each service in the transport stream. This twelve-hour period corresponds to

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delivery of the following event information tables: EIT-0, -1, -2 and -3;

(C) The format of event information data format shall conform to ATSC A/65B: “ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable (Revision B)” (incorporated by reference, *see* § 76.602);

(D) Each channel shall be identified by a one- or two-part channel number and a textual channel name; and

(E) The total bandwidth for PSIP data may be limited by the cable system to 80 kbps for a 27 Mbits multiplex and 115 kbps for a 38.8 Mbits multiplex.

(v) When service information tables are transmitted out-of-band for scrambled services:

(A) The data shall, at minimum, describe services carried within the transport stream carrying the PSIP data itself;

(B) A virtual channel table shall be provided via the extended channel interface from the POD module. Tables to be included shall conform to ANSI/SCTE 65 2002 (formerly DVS 234): “Service Information Delivered Out-of-Band for Digital Cable Television” (incorporated by reference, *see* § 76.602).

(C) Event information data when present shall conform to ANSI/SCTE 65 2002 (formerly DVS 234): “Service Information Delivered Out-of-Band for Digital Cable Television” (incorporated by reference, *see* § 76.602) (profiles 4 or higher).

(D) Each channel shall be identified by a one- or two-part channel number and a textual channel name; and

(E) The channel number identified with out-of-band signaling information data should match the channel identified with in-band PSIP data for all unscrambled in-the-clear services.

(2) All digital cable systems shall comply with:

(i) SCTE 28 2003 (formerly DVS 295): “Host-POD Interface Standard” (incorporated by reference, *see* § 76.602).

(ii) SCTE 41 2003 (formerly DVS 301): “POD Copy Protection System” (incorporated by reference, *see* § 76.602).

(3) Cable operators shall ensure, as to all digital cable systems, an adequate supply of PODs that comply with the standards specified in paragraph (b)(2) of this section to ensure convenient ac-

cess to such PODs by customers. Without limiting the foregoing, cable operators may provide more advanced PODs (*i.e.*, PODs that are based on successor standards to those specified in paragraph (b)(2) of this section) to customers whose unidirectional digital cable products are compatible with the more advanced PODs.

(4) Cable operators shall:

(i) Effective April 1, 2004, upon request of a customer, replace any leased high definition set-top box, which does not include a functional IEEE 1394 interface, with one that includes a functional IEEE 1394 interface or upgrade the customer’s set-top box by download or other means to ensure that the IEEE 1394 interface is functional.

(ii) Effective July 1, 2011, include both:

(A) A DVI or HDMI interface and

(B) A connection capable of delivering recordable high definition video and closed captioning data in an industry standard format on all high definition set-top boxes, except unidirectional set-top boxes without recording functionality, acquired by a cable operator for distribution to customers.

(iii) Effective December 1, 2012, ensure that the cable-operator-provided high definition set-top boxes, except unidirectional set-top boxes without recording functionality, shall comply with an open industry standard that provides for audiovisual communications including service discovery, video transport, and remote control command pass-through standards for home networking.

[68 FR 66734, Nov. 28, 2003, as amended at 76 FR 40279, July 8, 2011]

### Subpart L—Cable Television Access

#### § 76.701 Leased access channels.

(a) Notwithstanding 47 U.S.C. 532(b)(2) (Communications Act of 1934, as amended, section 612), a cable operator, in accordance with 47 U.S.C. 532(h) (Cable Consumer Protection and Competition Act of 1992, section 10(a)), may adopt and enforce prospectively a